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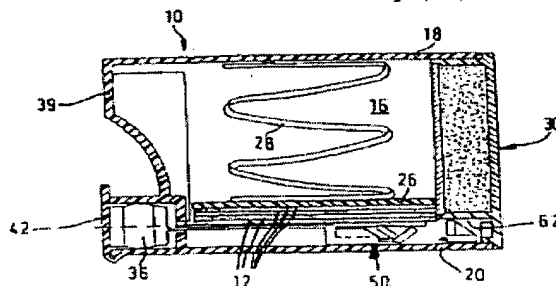
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DE-AS	10 02 730
FR	25 16 898
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US	44 71 885
US	33 93 831
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US	12 36 514

**(54) Dispenser-container for ribbon-like material strips**

(57) Long, flat container (10), loadable through a lid that opens on the front, for a supply of ribbon-like material strips (12), in particular of test strips for proving the presence of certain materials in fluids. Inside the housing (14), whose inside dimensions are designed to accommodate a stack of ribbon-like material strips (12), there is, parallel to the narrow sides of the housing, a platform (22) for a stack of material strips (12) to be put into the container, formed by two ledge-like projections (22a, 22b), each protruding from one of the opposing sidewalls (16) forming the flat sides of the housing (14), and leaving between them a long open slit (24).

In the extension of the platform (22) there is a slit (40) in the front of the housing (14) whose dimensions are such that the material strip (12) lying at the bottom of the stack can be pulled out, and there is a slide (50) in the area between the platform (22) and the adjacent narrow side of the housing that can be moved by a handle outside the housing (14) and that has an entrainment tongue (60) passing through the slit (24) formed in the platform (22) whose dimension is such that in the function setting it protrudes beyond the platform (22) at most by the thickness of the ribbon-like material strip (12).



The following information is taken from documents submitted by the applicant

## Description

The invention concerns a long, flat container, loadable through a lid that opens on the front, for a supply of ribbon-like material strips, in particular test strips for proving the presence of certain materials in fluids.

The need for the protected availability and individual dispensation of ribbon-like material is present in many areas, among which in this case the containers for test strips are singled out that serve e.g. on a regular basis for determining or monitoring the sugar level in blood or urine or other materials in bodily fluids. Often such tests must be carried out by the affected persons at relatively short intervals, forcing them to have a supply of test strips handy at all times. In the process it must be ensured that the container for holding the test strips protects them from outside influences that would impair their function, e.g. from air humidity. By the same token it must be small enough to be carried around in dress pockets without being noticed. It also should allow the simple and quick withdrawal of individual test strips without risking the loss of other test strips or of their effectiveness.

Carrying containers for such test strips were until now flat containers from which individual test strips were withdrawn after opening the lid. If the lid was in one of the flat ends, the test strips had to be shaken out individually, which could not totally prevent other test strips from falling out. In case of moisture-sensitive test strips there was always the possibility to seal the test strips individually in a moisture-proof foil or design the container – similar to known medicine flasks or ampoules for moisture-sensitive medicines – in the form of a dry-material container in which air humidity penetrating into the container upon opening was absorbed by the dry material enclosed in a chamber of the container and separated from the inside of the container by a moisture-permeable wall. It is obvious that sealing each individual test strip in a moisture-proof foil is expensive, while on the other hand the design of the container as dry-material container has the disadvantage that the individual effectiveness depends on how long the container lid remains open during withdrawal. Test strips falling out during withdrawal and coming in contact with humidity may have substantially impaired effectiveness, making it imperative to put instructions on the container advising against returning such test strips to the container.

The invention has the purpose to create a dispenser-container for a supply of ribbon-like material strips that does not have the disadvantages mentioned, that permits in particular the withdrawal of individual material strips without the risk of at the same time losing other strips. Also, the container should be designed for moisture-sensitive material strips in such a way that the effectiveness of the strips is not impaired by humidity down to the last material strip taken from the container.

Based on a container of the type mentioned in the introduction, the purpose of to the invention is achieved by designing, inside the housing, whose inside dimensions are designed to accommodate a stack of ribbon-like material strips, and parallel to the narrow sides of the housing, a platform for a stack of material strips to be put into the container, formed by two ledge-like projections, each protruding from one of the opposing sidewalls forming the flat sides of the housing, and leaving between them a long open slit, by providing in the extension of the platform a slit in the front of the housing whose dimensions are such that the material strip lying at the bottom of the stack can be pulled out, and there is a slide in the area between the platform and the adjacent narrow side of the housing that can be moved by a handle outside the housing and that has an entrainment tongue passing through the slit formed in the platform whose dimension

is such that in the function setting it protrudes beyond the platform (22) at most by the thickness of the ribbon-like material strip. With the container designed in such a way, the material strip lying on the bottom of the platform can be dispensed by the slide through the slit in the housing. There is therefore no risk that further material strips will drop out unintentionally.

In particular with soft, bendable material strips, e.g. test strips made of porous paper impregnated with the indicator material, it is recommendable to provide, inside the housing, a cocked pressure plate resting on the uppermost material strip opposite the platform of the stack inserted in the container and flexing in the direction of the platform. This brings the material strips between the platform and the pressure plate into a parallel, straight alignment, ensuring the dispensation of the bottom material strip through the slit in the housing.

For the mentioned moisture-sensitive material strips it is recommended to provide, in the lid of the container in manner known from the state of the art, for a chamber filled with a hygroscopic drying agent and separated from the inside of the housing by a water vapor-permeable wall.

In order to prevent the penetration of water vapor or humidity under all circumstances, it is also helpful to provide for a closing device in the area of the slit where the material strips are dispensed that opens or hermetically seals the slit.

This closing device may for example take the form of a stopper that can be pressed into a stopper uptake located before the slit.

This closing device may also feature a plate-like lid hinged on the housing that can be rotated to a withdrawal position opening the slit of the housing or to a closed position closing the slit.

It is useful to provide the slide with a long pull-push device which exits from the housing at its end opposite the slide below the slit of the platform and has a handle at its free end.

The end of the pull-push device opposite the slide may be connected to the closing element activated for shutting the closing device, i.e. the closing stopper or lid. In this case the closing element is also the activation handle for the slide so that a material strip is automatically dispensed through the slit in the housing and conveniently offered whenever the closing device opens. The slide overall or a part of the slide carrying the entrainment tongue can be designed to swivel around an axis running perpendicular to the pulling direction of the pull-push device and parallel to the supporting area of the platform in such a way that it can be rotated from the one swivel end position in which the entrainment tongue protrudes through the slit to the supporting area into a position upon moving back the slide after the successful withdrawal of a material strip in which the entrainment tongue is pushed back into a position lying under the supporting area of the platform.

It is useful for the slide or the rotatable part of the slide to be cocked and flexing in the material strip entrainment position, i.e. in the swivel position, in which the entrainment tongue passes through the slit onto the platform. When the slide is moved back after the withdrawal of a material strip, the rotatable part of the slide is pushed back to the opposite direction by the underside of the next material strip resting on the platform until the entrainment position is reached in which the rotatable slide part is swiveled around again to the entrainment position by the cocked spring.

In the preferred embodiment of the invention, the slide and the pull-push device are cast in one piece from plastic, whereby the rotatable articulation of the slide with the pull-push device or the rotatable part of the slide is achieved on the non-rotatable part by an integral hinge.

The spring cocking the slide or the rotatable part of the slide in the entrainment position may also be designed as an integral part of the slide/pull-push device.

In order to allow the rotatable part of the slide in the fully retracted position to rise to the entrainment position, a chamber, whose height is enlarged in comparison to the inside distance between the underside of the platform and the adjacent narrow side of the housing, is provided in the inside of the container in the area in which the slide is in the fully retracted position. In case the end of the pull-push device opposite the slide is coupled to the closing element of the slit in the housing, it is useful to connect the end of the pull-push device opposite the slide to the closing element via a latch connection.

Other useful embodiments and advantages of the container according to the invention are described below in connection with the drawing of an example of an embodiment, namely:

Fig. 1 shows a longitudinal cross section through a dispenser-container for test strips designed according to the invention;

Fig. 2 shows a view of the front end of the container opposite the lid, seen in the direction of arrow 2 in Fig. 1;

Fig. 3 shows a sectional view through the container seen in the direction of arrows 3-3 in Fig. 1;

Fig. 4 shows a view of the side of the lid of the container that is inside the container, see in the direction of arrow 4 in Fig. 1;

Fig. 5 shows an enlarged partial section of the area of the container lying within the dotted circle 5 in Fig. 1, with the closing device that normally hermetically seals the slit in the housing being open and the slide being shown in the material strip-dispensing position;

Fig. 6 shows a view seen in the direction of arrow 6 in Fig. 5; and

Fig. 7 shows a top view onto the slide provided for in the container according to the invention with the pull-push device attached in one piece.

The container shown in Fig. 1 to 4, in its entirety referred to by 10, serves to accommodate test strips 12. It has a flat shape, essentially square from the side view, which allows for easy carrying in dress pockets. The housing 14 of the container 10 has parallel plane side walls 16 that have an clear inside distance from each other corresponding to about the width of the test strips 12 and that are closed along the upper and lower narrow end by – in the case shown – walls 18 with a curve-shaped cross section. Approximately in the area of the transition from the wall 20 forming the lower narrow end to the side walls 16, long ledge-like projections 22a, 22b protrude from the inside of each side wall between which a slit 24 is left open. The plane upper surfaces of the projections 22a and 22b form a platform 22 for the respective bottom test strip 12 of a stack of test strips inserted into the container housing 14. On the opposing top test strip 12 lies a pressure plate 26 that is cocked by a spring 28 in the direction to the platform 22 braced by a closing wall 18 at the upper narrow side of the housing 14, so that the test strips 12 of the stack inserted in the container are kept together evenly and in close contact.

The front end of the housing 14 lying to the right in Fig. 1 is hermetically sealed by a lid 30 pressed into the interior of the housing like a stopper in which there is a receiving chamber 32 filled with a drying agent (silica gel; ziolith) which in its side turned toward the interior of the housing is closed by a water vapor-permeable porous wall 34. The opposing end wall 39 has a suitable uptake 38 at the height of the platform 22 for receiving a stopper 36 in whose bottom a

slit 40 is provided in alignment with the bottom test strip 12 held on the platform 22 of the test strip stack that is dimensioned in such a way that the test strip 12 that is at the bottom of the stack at the time can be pushed out through the slit.

The stopper 36 in the case shown is closed by a cover plate 42 with an enlarged diameter that is hinged via an integral hinge 44 with no possibility of detachment to the wall 20 forming the lower narrow side of the housing 14. The portion of the front end remaining above the stopper uptake 38 is closed by a front wall 39 that snaps into the interior of the housing in the transition area to accommodate the stopper uptake 38 in order to be able to grab the area of the cover plate 42 converted to a handle and opposing the integral hinge 44.

In the room between the underside of the platform 22 and the wall 20 closing the lower narrow side of the housing is a slide 50, which is shown in Fig. 5 and 7 in a scale enlarged compared to Fig. 1.

The slide 50 is cast in one piece of plastic together with the long, ribbon-like pull-push device 52. The pull-push device 52 in turn passes through an enlargement 54 (Fig. 6) provided in the underside of the slit in the housing 40 and has an enlarged anchor head 56 at its end opposite the slide that engages between two latch tongues 58 protruding within the stopper 36 beyond the cover plate and thus remains attached to the stopper. When the stopper 36 is opened the slide 50 is entrained from its right-most position to the left end position shown in Fig. 5. It can be seen in Fig. 5 that the slide 50 is divided into two slide parts 50a, 50b, of which the left slide part 50a, which is engaged by the pull-push device 52, lies totally below the upper supporting area of platform 22, while the right slide part 50b has an entrainment tongue 60 passing through the slit 24 formed between the ledge-like projections 22a, 22b and protruding behind the test strips 12 lying in the stack. In the closed position of the stopper 36 the slide 50 is pushed so far to the right by the pull-push device 52 that the entrainment tongue 60 of the slide 50b rests beyond the right ends of the ledge-like projections 22a, 22b in a receiving chamber 62 formed below the receiving chamber 34 of the lid 30 and enlarged height-wise. The slide parts 50a and 50b can be rotated relative to each other by an integral hinge 50c with the result that the right slide part 50b is able to tip in the counter-clock direction when the slide 50 is moved back and after withdrawing the test strip 12, whereby its entrainment tongue 60 is put into a position that is flush with the supporting area of the platform 22 by the next test strip 12 of the stack. After the slide 50 has come to the right end position by the complete closure of the stopper 36, the slide part 50b is able to swivel back to the open position in which the entrainment tongue 60 protrudes beyond the upper supporting area of the platform 22. To enable this swiveling back, both slide parts 50a and 50b are cocked via a spring 50d in the sense of a rotation of the slide part 50b in clockwise direction. The spring 50d (Fig. 5 and 6) is formed in this special case by two curve-shaped, integrally sprayed-on bridges that engage both the slide part 50a and slide part 50b.

It is obvious that changes and developments of the described container 10 are feasible within the framework of the inventive idea, for example those that have to do with the design of the closing device for the receiving chamber 38. For example, the rotatable articulation of the stopper 36 by way of an integral hinge may be dispensed with, without having to fear a loss of the stopper through the connection to the push-pull device 52. On the other hand, the pull-push device does not have to be coupled to the stopper 36, but can have a separate handle lying in the closed position of the stopper 36 within the stopper, which after opening the stopper must however be grasped separately and pulled out from the receiving chamber 38 in order to release the test strip.

### Patent Claims

1. Long, flat container, loadable via a lid that opens on the front, for a supply of ribbon-like material strips, in particular of test strips for proving the presence of certain materials in fluids, **characterized by the fact** that inside the housing (14), whose inside dimensions are designed to accommodate a stack of ribbon-like material strips (12), there is, parallel to the narrow sides of the housing (14), a platform (22) for a stack of material strips (12) to be put into the container, formed by two ledge-like projections (22a, 22b), each protruding from one of the opposing side-walls (16) forming the flat sides of the housing, and leaving between them a long open slit (24), that in the extension of the platform (22) there is a slit (40) in the front of the housing (14) whose dimensions are such that the material strip (12) lying at the bottom of the stack can be pulled out, and that there is a slide (50) in the area between the platform (22) and the adjacent narrow side of the housing that can be moved by a handle outside the housing (14) and that has an entrainment tongue (60) passing through the slit (24) formed in the platform (22) whose dimension is such that in the function setting it protrudes beyond the platform (22) at most by the thickness of the ribbon-like material strip (12)
2. Container according to Claim 1, characterized by a cocked pressure plate (26) provided in the interior of the housing, resting on the uppermost material strip (12) opposite the platform of the stack inserted in the container (10) and flexing in the direction of the platform (22).
3. Container according to Claim 1 or 2, characterized by the fact that, in a manner known from the state of the art, there is a receiving chamber (32) in the lid (30) of the container (10) filled with a hygroscopic drying agent and separated from the interior of the housing by a water vapor-permeable wall (34).
4. Container according to one of the Claims 1 to 3, characterized by the fact that there is a closing device in the area of the slit (40) intended for dispensing material strips (40) that opens or hermetically seals the slit (40).
5. Container according to Claim 4, characterized by the fact that the closing device is a stopper (36) that can be pressed into a stopper chamber (38) located before the slit.
6. Container according to Claim 4 or 5, characterized by the fact that the closing device (36, 38) has a plate-like lid (42) hinged to the housing (14) to allow it to be rotated.
7. Container according to Claim 1 and 4, characterized by the fact that a long pull-push device (52) is connected to the slide (50) which exits from the housing (14) at the end area opposite the slide below the slit (24) of the platform (22) and that has a handle at its free end.
8. Container according to Claim 7 and one of the Claims 4 to 6, characterized by the fact that the end of the pull-push device (52) opposite the slide is coupled to the closing element (36, 38) activated for opening the closing device.

9. Container according to Claim 7 or 8, characterized by the fact that the slide (50) as a whole or a part (50a) of the slide (50) carrying the entrainment tongue (60) is designed to swivel around an axis running perpendicular to the pulling direction of the pull-push device (52) and parallel to the supporting area of the platform (22) in such a way that it can be swiveled from one swivel end position in which, upon moving back the slide (50) after the successful withdrawal of a material strip (12), the entrainment tongue (60) passes through the slit (24) onto the platform (22) and into a position in which the entrainment tongue (60) is pushed back into a position lying under the supporting area of the platform (22).

10. Container according to Claim 9, characterized by the fact that the slide (50) or the rotatable part (50b) of the slide (50) is cocked flexing toward the material strip entrainment position.

11. Container according to Claim 10, characterized by the fact that the slide (50) and the pull-push device (52) are cast in one piece from plastic, and that the rotatable articulation of the slide (50) with the pull-push device or of the rotatable part (50b) of the slide with the non-rotatable part (50a) occurs by way of an integral hinge.

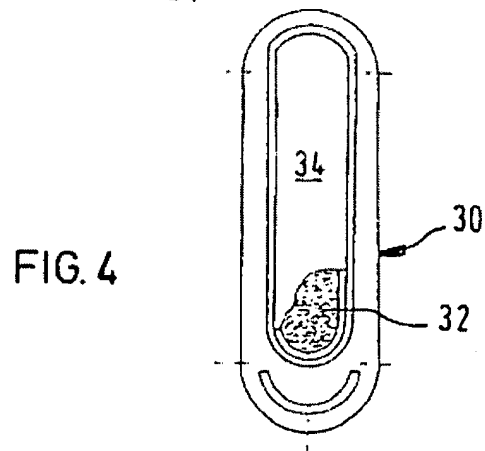
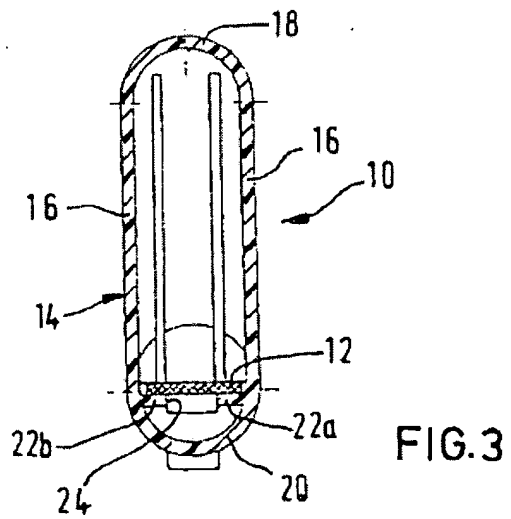
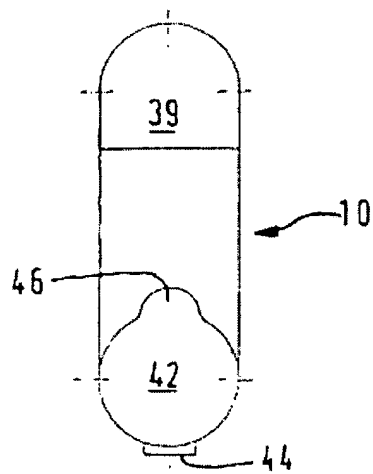
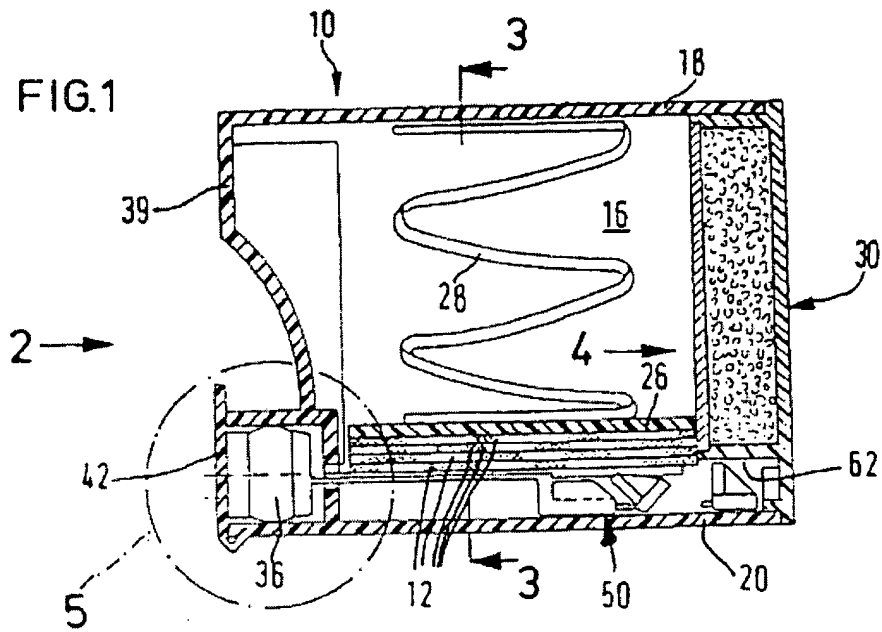
12. Container according to Claims 10 and 11, characterized by the fact that the spring (50d) cocking the slide (50) or the rotatable part (50b) of the slide (50) in the entrainment position is an integral part of the pull-push device.

13. Container according to one of the Claims 9 to 12, characterized by the fact that the slide (50) or the rotatable part (50b) of the slide (50) in fully retracted position is located within in a receiving chamber (62) enlarged in height compared to the inside distance from the underside of the support (22) to the adjacent short end of the housing (14).

14. Container according to Claim 8, characterized by the fact that the end of the pull-push device (52) opposite the slide is connected by a latch connection to the closing element (36, 38) activated for opening the closing device.

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2 page(s) of drawings attached





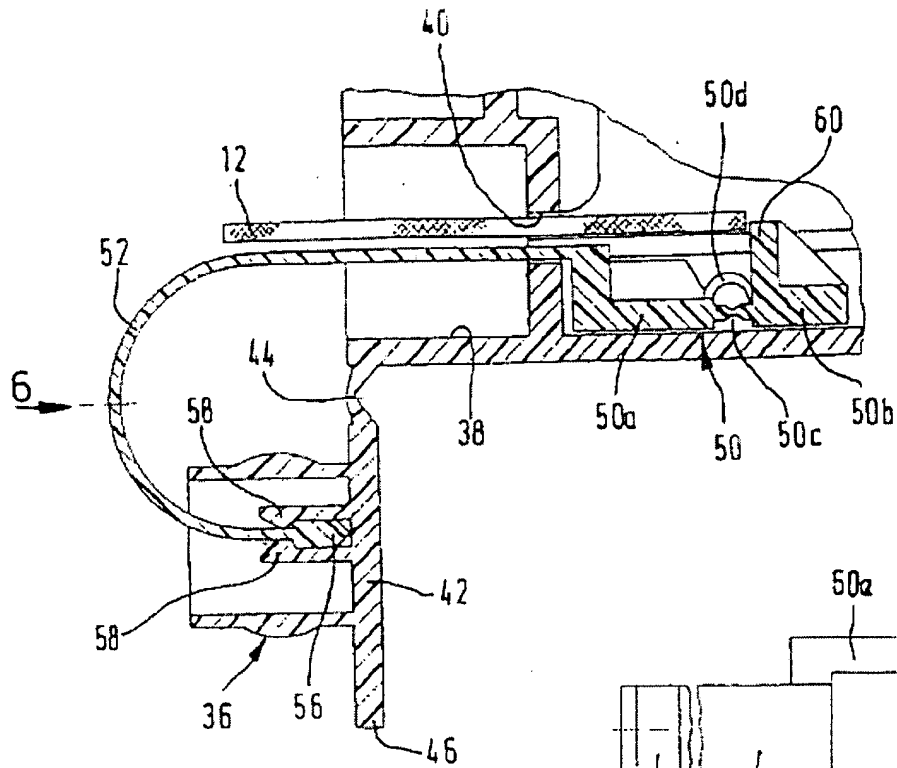


FIG. 5

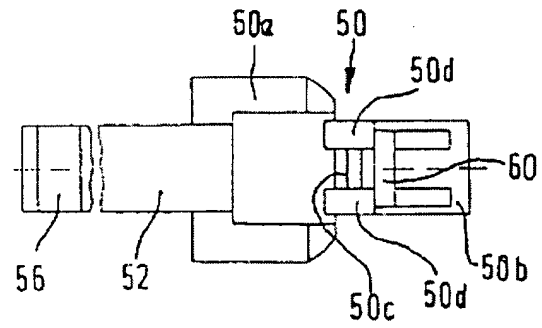


FIG. 7

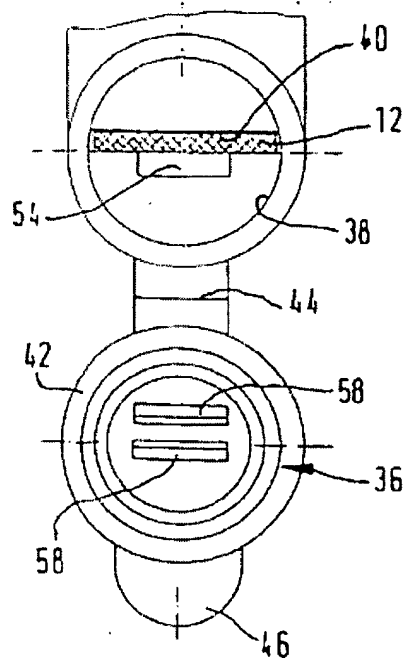


FIG. 6